

CLAIMS

We claim:

1. A system for data representation, comprising:
 - (A) a viewport, having a time coordinate;
 - (B) a background object, within said viewport, said background object having a first data driven attribute; and
 - (C) a foreground object, within said viewport, said foreground object having a second data driven attribute.
2. A system for data representation, as recited in claim 1, wherein said first data driven attribute is provided by a medical system.
3. A system for data representation, as recited in claim 1, wherein said second data driven attribute is provided by a medical system.
4. A system for data representation, as recited in claim 1, wherein said first data driven attribute is provided by a physiological system.
5. A system for data representation, as recited in claim 1, wherein said second data driven attribute is provided by a physiological system.
6. A system for data representation, as recited in claim 1, wherein said first data driven attribute is provided by an economic system.
7. A system for data representation, as recited in claim 1, wherein said second data driven attribute is provided by an economic system.
8. A system for data representation, as recited in claim 1, wherein said first data driven attribute is provided by a mechanical system.

1 9. A system for data representation, as recited in claim 1, wherein said second data
2 driven attribute is provided by a mechanical system.

3 10. A system for data representation, as recited in claim 1, wherein said first data
4 driven attribute is provided by an electrical system.

5 11. A system for data representation, as recited in claim 1, wherein said second data
6 driven attribute is provided by an electrical system.

7 12. A system for data representation, as recited in claim 1, wherein said time
8 coordinate provides real-time display time frames.

9 13. A system for data representation, as recited in claim 1, wherein said time
10 coordinate provides historical time frames.

11 14. A system for data representation, as recited in claim 1, wherein said time
12 coordinate provides discrete time frames.

13 15. A system for data representation, as recited in claim 1, further comprising an
14 audible channel based on a third data driven attribute.

15 16. A system for monitoring the health of a dynamic system, comprising:

16 (A) a system for monitoring;

17 (B) one or more sensors in communication with said system for monitoring;

18 (C) a data formatter in communication with said one or more sensors and
19 generating a data signal; and

20 (D) a data modeling computer system receiving said data signal and generating
21 a display representation of said data signal.

- 1 17. A system for monitoring the health of a dynamic system, as recited in claim 16,
2 further comprising a simulator for simulating said system for monitoring, wherein
3 said simulator is in communication with said data formatter.
- 4 18. A system for monitoring the health of a dynamic system, as recited in claim 16,
5 further comprising a data recorder connected to said data formatter to store said
6 data signal.
- 7 19. A system for monitoring the health of a dynamic system, as recited in claim 18,
8 further comprising a speed select in communication with said data recorder to
9 permit the adjustment of the rate of display of said stored data signal.
- 10 20. A system for monitoring the health of a dynamic system, as recited in claim 16,
11 further comprising a customizer to modify the display provided to a user, said
12 customizer being in communication with said data modeling computer system.
- 13 21. A system for monitoring the health of a dynamic system, as recited in claim 16,
14 wherein said system for monitoring is a natural system.
- 15 22. A system for monitoring the health of a dynamic system, as recited in claim 16,
16 wherein said system for monitoring is an artificial system.
- 17 23. A method for processing for display and analysis of a variable of a dynamic
18 system, comprising:
- 19 (A) initializing internal data;
20 (B) entering an event loop;
21 (C) waiting for user input;
22 (D) receiving data;
23 (E) computing object properties;

1 (F) rendering an object; and

2 (G) displaying said object.

3 24. A method for processing for display and analysis of a variable of a dynamic
4 system, as recited in claim 23, further comprising selecting smooth animation.

5 25. A method for processing for display and analysis of a variable of a dynamic
6 system, as recited in claim 23, wherein said received data further comprises data
7 from sensors.

8 26. A method for processing for display and analysis of a variable of a dynamic
9 system, as recited in claim 23, wherein said received data further comprises data
10 from a system simulator.

11 27. A method for processing for display and analysis of a variable of a dynamic
12 system, as recited in claim 23, wherein said computing object properties, further
13 comprises selecting displayable properties from the group consisting of
14 transparency, texture, color, hue, shape, and distortion.

15 28. A method for the display of dynamic system values to aid in the analysis and
16 monitoring of the dynamic system, comprising:

17 (A) receiving data from a sensor;

18 (B) formatting and normalizing said received data;

19 (C) processing said formatted and normalized data into a displayable object
20 format; and

21 (D) displaying said displayable object formatted data.

1 29. A method for the display of dynamic system values to aid in the analysis of the
2 dynamic system, as recited in claim 28, further comprising receiving data from a
3 simulator.

4 30. A method for the display of dynamic system values to aid in the analysis of the
5 dynamic system, as recited in claim 28, further comprising: getting a window
6 identification of the current rendering context and finding a data structure which
7 corresponds to the current window.

8 31. A system for data representation, comprising:

9 (A) an information environment;

10 (B) a framework within said information environment;

11 (C) an object located about said framework, wherein said object is correlated
12 with data for representation; and

13 (D) a audible sound associated with said object.

14 32. A system for data representation, as recited in claim 31, wherein said data for
15 representation is derived from a natural dynamic system.

16 33. A system for data representation, as recited in claim 31, wherein said data for
17 representation is derived from an artificial dynamic system.

18 34. A system for data representation, as recited in claim 31, further comprising sensor
19 presented information relating to the health of said data, based on the relationship
20 between one or more objects.

21 35. A system for data representation, as recited in claim 34, wherein said sensor
22 provided information shows a measurement of the interaction between one or
23 more vital signs of a natural dynamic system.

- 1 36. A system for data representation, as recited in claim 31, further comprising a three
2 dimensional and auditory health-space for mapping system data.
- 3 37. A system for data representation, as recited in claim 31, wherein said object
4 further comprises a display showing the relationship between a data object and an
5 expected normal shape and location for said data object.
- 6 38. A system for data representation, as recited in claim 34, wherein the health of a
7 system is shown by placing said object within a health space.
- 8 39. A system for data representation, as recited in claim 34, wherein the health of a
9 system is shown by placing said object within a life space.
- 10 40. A system for data representation, as recited in claim 31, wherein said correlation
11 of said data and said object is shown be an attribute, wherein said attribute is
12 selected from the group consisting of apparent volumetric density, 3-D enclosure,
13 deformation, secondary forms of said object, degree of opacity, degree of texture,
14 color, hue, atmospheric density, audible sounds, size and position.
- 15 41. A system for data representation, as recited in claim 31, wherein said correlation
16 is shown by a three-dimensional shape.
- 17 42. A system for data representation, as recited in claim 31, wherein said object
18 further comprises a major axis and a minor axis, and wherein said major axis and
19 said minor axis have a length dimension that represent a data value.
- 20 43. A system for data representation, as recited in claim 41, wherein said three
21 dimensional shape of said object changes as the correlation between said data and
22 said object changes.

- 1 44. A system for data representation, as recited in claim 40, wherein said attribute
2 changes as said data changes.
- 3 45. A system for data representation, as recited in claim 42, wherein said major axis
4 and said minor axis change in said length dimension as said data changes
- 5 46. A system for data representation, as recited in claim 31, wherein said framework
6 further comprises a time reference axis.
- 7 47. A system for data representation, as recited in claim 31, further comprising a
8 means for the selection of a user viewpoint from a plurality of potential user
9 viewpoints.
- 10 48. A system for data representation, as recited in claim 47, wherein said viewpoints
11 can be selected from the group consisting of a perspective view, an immersive
12 Virtual Reality view and an orthographic view.
- 13 49. A system for data representation, as recited in claim 31, further comprising a
14 means for display of a layout of a plurality of time-space viewpoints.
- 15 50. A system for data representation, as recited in claim 31, further comprising a
16 means for zooming in and out of a time-space coordinate.
- 17 51. A system for data representation, as recited in claim 31, further comprising a
18 means for displaying the history of said data.
- 19 52. A system for data representation, as recited in claim 31, further comprising a
20 means for customizing a display of said objects.
- 21 53. A system for data representation, as recited in claim 31, further comprising a
22 means for storing said objects for display at a later time.

- 1 54. A system for data representation, as recited in claim 53, wherein said means for
2 storing further comprises a means for speeding up a display of said objects.
- 3 55. A system for data representation, as recited in claim 43, wherein said means for
4 storing further comprises a means for slowing down a display of said objects.
- 5 56. A system for data representation, as recited in claim 31, further comprising a
6 means for the providing a user with a comparison of a data driven object with
7 expected location, size, shape and color of said data driven object.
- 8 57. A system for data representation, as recited in claim 1, wherein said time
9 coordinate provides continuous time frames.

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